

214505US-8-PCT

IN THE UNITED STATES PATENT & TRADEMARK OFFICE

IN RE APPLICATION OF: :  
YUICHI WATANABE : ATTN: APPLICATION DIVISION  
SERIAL NO: NEW U.S. PCT APPLN :  
(Based on PCT/JP01/00885)  
FILED: HEREWITH : EXAMINER:  
FOR: APPARATUS AND CIRCUIT FOR :  
POWER SUPPLY, AND APPARATUS  
FOR CONTROLLING LARGE CURRENT  
LOAD

PRELIMINARY AMENDMENT

ASSISTANT COMMISSIONER FOR PATENTS  
WASHINGTON, D.C. 20231

SIR:

Prior to a first examination on the merits, please amend the above-identified  
application as follows:

IN THE SPECIFICATION

Page 8, beginning lines 2-16, delete the existing paragraph and replace it with the  
following paragraph:

In this control apparatus, however, the power MOS-FET used as the switching  
element of on/off control generates much heat. Therefore, it is necessary to perform the  
radiation design accurately. A channel temperature  $T_{ch}$  max of the power MOS-FET is  
calculated as

$$T_{ch} \text{ max} = (T_a \text{ max}) + (R_{on} \text{ max}) \times (I_o \text{ max}) \\ \times (I_o \text{ max}) \times R_{th} (ch-a)$$

$$= 85^{\circ}\text{C} + 0.013\Omega \times 10\text{A} \times 10\text{A} \times 50^{\circ}\text{C/W}$$

$$= 150^{\circ}\text{C}$$

where Ta max: ambient temperature

Ron max: on-resistance

Io max: current value

Rth (ch-a): thermal resistance between channel and environment.

#### REMARKS

The present preliminary amendment is submitted to correct for a minor informality in the specification, which is deemed to be self-evident from the original disclosure.

The present application is believed to be in condition for a full and thorough examination on the merits. An early and favorable consideration of the present application is hereby respectfully requested.

Respectfully submitted,

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Serial No: \_\_\_\_\_

Amendment Filed on: \_\_\_\_\_

10-5-01

IN THE SPECIFICATION

Page 8, beginning line 5, delete the existing paragraph and replace it with the following paragraph:

--In this control apparatus, however, the power MOS-FET used as the switching element of on/off control generates much heat. Therefore, it is necessary to perform the radiation design accurately. A channel temperature  $T_{ch \max}$  of the power MOS-FET is calculated as

$$\begin{aligned} T_{ch \max} &= (T_{a \max}) + (R_{on \max}) \times (I_{o \max}) \\ &\quad \times (I_{o \max}) \times R_{th (ch-a)} \quad [ \dots (10) ] \\ &= 85^{\circ}\text{C} + 0.013\Omega \times 10\text{A} \times 10\text{A} \times 50^{\circ}\text{C/W} \\ &= 150^{\circ}\text{C} \end{aligned}$$

where  $T_{a \max}$ : ambient temperature

$R_{on \max}$ : on-resistance

$I_{o \max}$ : current value

$R_{th (ch-a)}$ : thermal resistance between channel and environment.--